ASOS MODIFICATION NOTE 68 (for Electronics Technicians)
Engineering Division
W/OSO321: BGM

SUBJECT	:	Installing Visibility Firmware Version 040
PURPOSE	:	Eliminate the visibility sensor heater diagnostic errors
EQUIPMENT AFFECTED	:	Automated Surface Observing System (ASOS) Visibility Sensor (AVIS)
PARTS REQUIRED	:	Visibility Firmware Version 040, S100-2MT5A1A1-U2B
MOD PROCUREMENT	:	Technicians should order one S100-2MT5A1A1-U2B visibility erasable programmable read only (EPROM) version 040 for each visibility sensor and one for the spare controller card.
EFFECTIVITY	:	All ASOS Sites
SPECIAL TOOLS REQUIRED	:	IC Extraction Tool (ASN: 041-T-13) IC Insertion Tool (ASN: 041-T-16) Electrostatic Discharge (ESD) Straps
TIME REQUIRED	:	2 Hours
EFFECT ON OTHER INSTRUCTIONS	:	Supersedes Modification Note 48
CERTIFICATION STATEMENT	:	This modification is authorized by the National Weather Service Change S01104 (NWS5275). This modification was tested by the Engineering Division at Sterling, VA, and the National Reconditioning Center. Also tested at: Alturas, KS Corpus Christi, TX Buffalo, NY Klamath, OR

GENERAL

This modification note provides instructions for removal and replacement of the EPROM on the visibility sensor processor board.

The updated firmware corrects the visibility heater diagnostics and eliminates false heater failure(s). The EPROM on the visibility processor board changes from firmware version 039 to 040.

PROCEDURE

This procedure provides instructions for installing the EPROM (U2) firmware version 040 on the visibility sensor's processor board.

BEFORE INSTALLATION OF FIRMWARE VERSION 040

1. Contact the ASOS Operations and Monitoring Center (AOMC) at 1-800-242-8194 and provide notification on which ASOS will have the new firmware installed.

2. Get approval of the responsible meteorologist in charge (MIC)/official in charge (OIC)/observer before starting installation. The firmware may be installed on any day of the month if restrictions in steps 3 and 4 are satisfied.

3. **Commissioned sites only:** Do not start installation during inclement weather, precipitation, instrument flight rule conditions, or if any of those conditions are expected within 3 hours. The responsible MIC/OIC/observer will define those meteorological conditions.

4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although 1.5 hours should be sufficient, allow 2 hours to complete installation and restart the visibility sensor.

5. Immediately before beginning work NWS-staffed sites, the MIC/OIC/observer will inform the air traffic control tower (ATCT) and other critical users the ASOS visibility sensor will be shut off for firmware upgrade
   (for unstaffed sites, the electronics technician (ET) will inform the ATCT).

6. Do not begin the installation process until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal back-up observing procedures will be implemented.

7. The system voice function will automatically broadcast visibility missing messages when the visibility sensor power is turned off.

8. Make the appropriate SYSLOG entries, (MAINT-ACT-FMK) Mod 68
   a. Log on as **TECH**.
   b. Key the **MAINT** screen.
   c. Key the **ACT** page.
   d. Key **START** - Stop here and perform Modification Note 68.
   e. Upon completion of Modification Note 68, log onto the system.

9. Continue with “Visibility Sensor Firmware Removal and Replacement Procedure.”

VISIBILITY SENSOR FIRMWARE REMOVAL AND REPLACEMENT PROCEDURE

WARNING

Death or severe injury may result if power is not removed from the sensor before performing maintenance activities.

1. At the data collection package (DCP) cabinet, set the visibility sensor circuit breaker module to the **OFF** (right) position.

2. At the sensor, open the visibility sensor electronics enclosure access door and locate the processor board A1A1 (32194-1). Remove the captive screw securing the processor board to the standoff. (This screw is on the bottom side of the board).

3. Carefully remove the processor board by pulling it free from the backplane connector, XA1.

4. Using figure 1, locate microcircuit (or EPROM) U2.

CAUTION:

Follow all ESD procedures, found in Engineering Handbook No. 5 (EHB-5), Test Equipment and Techniques, while removing and installing EPROMs.

5. Remove the EPROM U2 from the processor board.

CAUTION:

Observe the proper pin 1 orientation and ensure EPROM legs do not get bent during the installation process.

6. Install EPROM firmware version 040 onto the processor board and press firmly into the socket.

7. Install and secure the processor board into the backplane connector XA1.

8. Inside the DCP, disconnect the visibility sensor’s DB-9 cable connector from the fiber-optic modem on top of the faraday box.

9. Connect the personal computer (PC) to the DB-9 cable connector in the DCP, using the Y-shaped RS232 adapter cable. Turn on the PC, initialize PROCOMM Plus, and press any key to enter the terminal mode. Check to ensure the communication protocol is set to “2400,N,8,1".

10. At the DCP, turn the visibility sensor circuit breaker to the **ON** (left) position.

11. Verify the PC displays the sensor initialization message shown below.

*** VIS VER 40.00 - 6220 ***

The "40.00" refers to the firmware version. For this procedure, the firmware version should be 40.00 or greater. The "6220" refers to the sensor model number.

12. Perform “Heater Power Supply Check” (steps 1-5) and “Heater Calibration” (steps 6-15), as per table 6.5.3 - Visibility Sensor Calibration, found on pages 6-45 of the Site Technical Manual (STM).

13. At the PC, type **VG**. The sensor will enter the V mode (Extended Diagnostics) and verify the response:

VPXXXXXXXXPPPP PPP0PP PPP PPPP XXXX XX

The sensor status bytes reported above should be all "P"s for pass, with the exception of byte 22, which should be "0" or "1." A "1" indicates the "Heater Diagnostics" for the hood and electronics heaters are being used, an "0" indicates they are not. The values marked with an "X" are irrelevant to this procedure and should be ignored. If any "P" is reported as an "F," refer to the ASOS STM, heater troubleshooting procedures, chapter 6, table 6.5.6, before proceeding.

14. At the PC, type **VF**. Enter password EIEIO. Press **ENTER** until the sensor serial number is requested. Enter the sensor serial number. Press **ENTER** until the **VF** command is completed, verifying the correct data is present.

15. At the PC, type **VH**. Press **ENTER** until the **VH** command is completed, verifying the correct data is present.

TEAR DOWN PROCEDURE

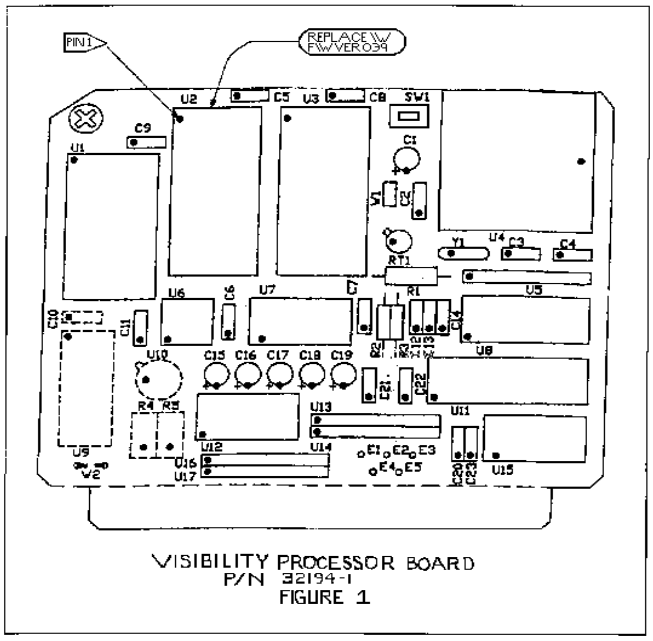
1. At the DCP, turn the visibility sensor circuit breaker to the **OFF** (right) position.

2. Disconnect the PC DB-9 cable connector from the fiber-optic modem, and install the visibility sensor’s DB-9 cable connector to the appropriate receptacle on top of the faraday box.

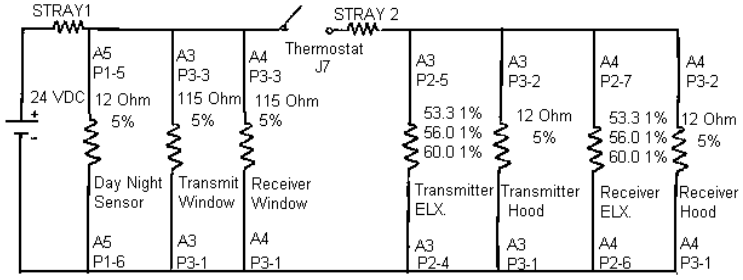
3. Close and secure the visibility sensor electronics enclosure access door.

4. At the DCP, turn the visibility sensor circuit breaker to the **ON** (left) position.

5. Continue with “After Installation of Firmware 040.”



VISIBILITY PROCESSOR BOARD
P/N 32194-1
FIGURE 1



Heater Diagram
Figure 2

AFTER INSTALLATION OF FIRMWARE 040

1. When visibility is reinstated at unstaffed sites, inform the ATCT the work is complete. (At staffed sites, the MIC/OIC/observer will call the ATCT).

2. If on site, NWS-staff provides backup while installation is underway. Special observation is not needed when ASOS is restarted.

3. Inform the office staff that ASOS is again operational. The chart below indicates the time it should take after start-up for the ASOS to report each observation element automatically.

Times Needed for Elements to be Reported Automatically

Sensor	Minimum Time (minutes)	Maximum Time (minutes)
Visibility	10	15
Obstruction to Visibility	10	**

** Maximum time not applicable since phenomena may not be present. Minimum time applies if phenomena are present.

4. Verify ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and inform the operator of:
   a. The ASOS location.
   b. The installation of firmware version 040 has been completed.
   c. The ASOS is operational.

5. Enter in the SYSLOG that maintenance has been completed.
   a. Key the **MAINT** screen.
   b. Key the **ACT** page.
   c. Key **FMK** - Enter the field modification kit (FMK) number as follows: **Mod 68**. On the second line of the screen, verify only Mod 68 is displayed. Complete by entering **Y** in the (Y/N) field if only Mod 68 is displayed. If Mod 68 is completed, make the appropriate log entry.
   d. Check the SYSLOG, and verify the FMK message. Enter a comment in the SYSLOG stating Mod 68 has been installed. Clear any maintenance flags caused by installing this modification.

6. At an expansion site with the ATCT, the ET will contact the ATCT and supply information on the following:
   a. The ASOS maintenance has been completed.
   b. The AVIS has been restored to service.

SHIPPING INSTRUCTIONS

After Modification Note 68 has been completed, package the old EPROMs in an anti-static package and ship to the National Reconditioning Center, attention Roger Helphrey, ASOS Repair Unit.

REPORTING MODIFICATION

Target date for completion of this modification is 30 days after receipt of parts. Report completed modification on an NWS Form A-26, Maintenance Record, using the instructions in Engineering Handbook No. 4 (EHB-4), Engineering Management Reporting System (EMRS), part 2, appendix F. Use reporting code **AVIS**. Record the modification note number in block_17a as 68. See appendix **A** for a completed sample of NWS Form A-26, Maintenance Record.

Original Signed

John McNulty
Chief, Engineering Division

Appendix A - A-26 Sample Form

W/OSO321:B.McCormick:713-1833x120
File:K:\OSO32\OSO321\Asos Temps\Asomod68.wpd
file updated:2/8/00:
spellcheck:11/15/99:src